

**80/388/NP****NEW WORK ITEM PROPOSAL**

Classification according to IEC Directives Supplement, Table 1	Proposer Secretary TC80	Date of proposal 2003-11
	TC/SC TC 80	Secretariat UK
	Date of circulation 2003-11-14	Closing date for voting 2004-02-20

A proposal for a new work item within the scope of an existing technical committee or subcommittee shall be submitted to the Central Office. The proposal will be distributed to the P-members of the technical committee or subcommittee for voting, and to the O-members for information. The proposer may be a National Committee of the IEC, the secretariat itself, another technical committee or subcommittee, an organization in liaison, the Standardization Management Board or one of the advisory committees, or the General Secretary. Guidelines for proposing and justifying a new work item are given in ISO/IEC Directives, Part 1, Annex C (see extract overleaf). **This form is not to be used for amendments or revisions to existing publications.**

The proposal (to be completed by the proposer)

Title of proposal

Maritime navigation and radiocommunication equipment and systems - Automatic Identification system -AIS fitted to aids to navigation (AtoN) - Minimum operational and performance requirements - methods of test and required test results

☒ Standard ☐ Technical Specification ☐ Publicly Available Specification

Scope (as defined in ISO/IEC Directives, Part 2, 6.2.1)

To specify the minimum safe operational and performance requirements; methods of testing and test results of AtoN AIS stations, taking into account other associated International Standards and existing national standards as appropriate.

Purpose and justification, including the market relevance and relationship to Safety (Guide 104), EMC (Guide 107), Environmental aspects (Guide 109) and Quality assurance (Guide 102) . (attach a separate page as annex, if necessary)

With the rapid development of the shore-based AIS infrastructure, including Aids-to-Navigation it is imperative that AtoN AIS stations are built, tested and installed to a standard that will ensure integrity of the technical operation of the AIS VHF data link and the consistency of the transfer of information from AtoN AIS stations to the mariners. To that end the AtoN AIS stations should meet a standard that will fully correspond to the requirements laid out in Recommendation ITU-R M.1371-1 together with the appropriate IALA Technical Clarifications.

Primary beneficiaries of this standard will be competent authorities setting up AtoN AIS stations as part of their AtoN service to the mariners, the mariners themselves, and also marine electronics manufacturers and distributors.

Target date for first CD 2005 for IS2006.....

Estimated number of meetings 4 Frequency of meetings: 2 per year Date and place of first meeting: .TBA.....

Proposed working methods ☐ E-mail ☐ ftp

Relevant documents to be considered

Attached outline

Draft IALA Recommendation [A-126] "AIS for Aids-to-Navigation" (Edition 1.0) (basis for the performance requirements)

IEC 62287-1 (TC80 WG8A; Class B mobile AIS station; to be completed by April 2004; this document could serve as a basis for the test requirements)

Recommendation ITU-R M.1371-1 together with IALA Technical Clarifications on Recommendation ITU-R M.1371-1 (latest edition)

Relationship of project to activities of other international bodies

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This item would be carried out jointly by IALA and IEC TC80, building on existing IALA documents as a basis for performance requirements. The work item would further develop this material from the IALA documents to ensure all requirements for an IEC standard are included, and the resulting document would be maintained by IEC TC80.

Liaison organizations IALA CIRM	Need for coordination within ISO or IEC
Preparatory work Ensure that all copyright issues are identified. Check one of the two following boxes <input type="checkbox"/> A draft is attached for vote and comment <input checked="" type="checkbox"/> An outline is attached We nominate a project leader as follows in accordance with ISO/IEC Directives, Part 1, 2.3.4 (name, address, fax and e-mail): Alan Stewart (Chairman); Jillian Carson-Jackson (Convener) e-mail:jillian.carson@wanado.fr	
Concerns known patented items (see ISO/IEC Directives, Part 2) <input type="checkbox"/> yes If yes, provide full information as an annex <input type="checkbox"/> no PATENT Issues to be further investigated	Name and/or signature of the proposer M A Rambaut
Comments and recommendations from the TC/SC officers	
1) Work allocation <input type="checkbox"/> Project team <input type="checkbox"/> New working group <input type="checkbox"/> Existing working group no: TC 80 WG 8A	
2) Draft suitable for direct submission as <input type="checkbox"/> CD <input type="checkbox"/> CDV <input type="checkbox"/> Publication as a PAS	
3) General quality of the draft (conformity to ISO/IEC Directives, Part 2) <input type="checkbox"/> Little redrafting needed <input type="checkbox"/> Substantial redrafting needed <input checked="" type="checkbox"/> no draft (outline only)	
4) Relationship with other activities In IEC: TC80 WG8A (Class B shipborne mobile AIS station) TC80 WG6 (Interfacing using IEC 61162 mechanisms) In other organizations IALA AIS, RNAV Committees	
Remarks from the TC/SC officers The TC 80 officers did not provide any comments.	

Elements to be clarified when proposing a new work item

Title

Indicate the subject matter of the proposed new standard.

Indicate whether it is intended to prepare a standard, a technical report or an amendment to an existing standard.

Scope

Give a clear indication of the coverage of the proposed new work item and, if necessary for clarity, exclusions.

Indicate whether the subject proposed relates to one or more of the fields of safety, EMC, the environment or quality assurance.

Purpose and justification

Give details based on a critical study of the following elements wherever practicable.

- The specific aims and reason for the standardization activity, with particular emphasis on the aspects of standardization to be covered, the problems it is expected to solve or the difficulties it is intended to overcome.
- The main interests that might benefit from or be affected by the activity, such as industry, consumers, trade, governments, distributors.
- Feasibility of the activity: Are there factors that could hinder the successful establishment or general application of the standard?
- Timeliness of the standard to be produced: Is the technology reasonably stabilized? If not, how much time is likely to be available before advances in technology may render the proposed standard outdated? Is the proposed standard required as a basis for the future development of the technology in question?
- Urgency of the activity, considering the needs of the market (industry, consumers, trade, governments etc.) as well as other fields or organizations. Indicate target date and, when a series of standards is proposed, suggest priorities.

- f) The benefits to be gained by the implementation of the proposed standard; alternatively, the loss or disadvantage(s) if no standard is established within a reasonable time. Data such as product volume or value of trade should be included and quantified.
- g) If the standardization activity is, or is likely to be, the subject of regulations or to require the harmonization of existing regulations, this should be indicated.

If a series of new work items is proposed, the purpose and justification of which is common, a common proposal may be drafted including all elements to be clarified and enumerating the titles and scopes of each individual item.

Relevant documents

List any known relevant documents (such as standards and regulations), regardless of their source. When the proposer considers that an existing well-established document may be acceptable as a standard (with or without amendments), indicate this with appropriate justification and attach a copy to the proposal.

Cooperation and liaison

List relevant organizations or bodies with which cooperation and liaison should exist.

Preparatory work

Indicate the name of the project leader nominated by the proposer.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND RADIOCOMMUNICATION
EQUIPMENT AND SYSTEMS -
AUTOMATIC IDENTIFICATION SYSTEM -****AIS fitted to aids to navigation (AtoNs) - Minimum operational and
performance requirements - methods of test and required test results**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC XXX has been prepared by subcommittee XX, of IEC technical committee XX:

The text of this standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until _____. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS - AUTOMATIC IDENTIFICATION SYSTEM -

AIS fitted to aids to navigation (AtoNs) - Minimum operational and performance requirements - methods of test and required test results

1 Scope

[to be drafted]

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC document to be developed (may become part of the IEC Class B Standard)

ITU-R M.1371-1: *Technical Characteristics for a Universal Automatic Identification System Using Time Division Multiple Access in the VHF Maritime Mobile Band*

IALA, Technical Clarifications on Recommendations ITU-R M.1371-1, Edition 1.3 or later. (The most recent edition should be used.)

[to be identified]

3 Terms, definitions and abbreviations

[to be drafted]

4 General

4.1 General requirements for receivers and transmitters in an AtoN AIS station

The AIS AtoN Station is an AIS station that must function in conjunction with Class A AIS Mobile Stations and therefore must conform to the same specifications to protect the VDL. An AIS AtoN Station may be designed to operate on a reduced power level and may also be more restricted in functionality than either the Shipborne Mobile station or the Base Station. The functions of the AtoN Station are discussed in this paper.

4.2 Configuration of AtoN AIS units

An AtoN AIS station should have an interface providing the means for configuration of

- Messages
- Reporting interval(s)
- Static data, e.g.
 - MMSI number
 - AtoN name
 - Type of AtoN
 - AtoN dimensions

For units used on floating aids, the nominal aid position in latitude and longitude must be entered as well as the radius of the acceptable position circle, outside which the off-station flag in Message 21 should be raised.

Where a Message is to be sent from the AtoN, the service provider must ensure that the Message is only sent when the relevant condition has been met [e.g. buoy off station] and it must be an addressed message sent only to vessels in the affected area and only sent until acknowledged. This is best achieved using Message 12. Message 14 should not be used.

The configuration method should be such that un-authorized or accidental re-configuration is prevented.

4.3 Built-in integrity test

The unit should have a built-in integrity test to detect failures that can disrupt the operation of the VDL, and should cease transmission if such a failure is detected. Table 1 applies.

The configuration interface, or another interface, should allow access to the unit for testing.

Table 1 - Integrity alarm conditions

Alarms description text	Reaction of the system
AIS: Tx malfunction	Stop transmission
AIS: Antenna VSWR exceeds limit	Continue operation
AIS: Rx channel 1 malfunction	Stop transmission on affected channel
AIS: Rx channel 2 malfunction	Stop transmission on affected channel
AIS: Rx channel 70 malfunction	Stop transmission on affected channel
AIS: general failure	Stop transmission
AIS: UTC clock lost	Continue operation using indirect or semaphore synchronisation

4.4 Functional definition of the radio interface of the AtoN AIS unit

4.4.1 General requirements of the physical layer

Table 3 is derived in part from ITU-R 1371-1 and the IALA Technical Clarifications on ITU-R 1371-1. It indicates how any given paragraph of Recommendation ITU-R M.1371-1 (together with appropriate IALA Technical Clarifications), which is indicated by the paragraph number, applies to the AtoN AIS station. The meaning of the column indications is:

- 'C' compulsory;
- 'N' not allowed;
- 'R' recommended;
- 'O' optional.

4.5 Requirements and Recommendations for the TDMA Receivers of the AtoN AIS Station

The technical characteristics as specified in Table 2 should apply to the TDMA receivers. The requirements indicated by (*) are compulsory for all AtoN AIS Stations, while all other parameters are recommended as a minimum. They may be subject to further regional requirements.

Table 2 - Required and recommended receiver characteristics

Receiver Parameters	25kHz channels	12.5kHz channels
Sensitivity (*)	20% PER for – 107 dBm	20% PER for – 104 dBm
Co-channel rejection	-10 – 0 dB	-18 – 0 dB
Adjacent channel selectivity	70 dB	50 db
Spurious response rejection	70 dB	N/A
Intermodulation response rejection and Blocking	20% PER	N/A

4.5.1 Message slot assignment

4.6 Additional technical points

The following points are for the guidance of service providers.

4.6.1 Power consumption

At many AtoN sites, the provision of electrical power is expensive. The addition of an AtoN AIS unit will increase the power demand, and the competent authority should make or obtain appropriate computations of AIS system power needs. Choice of interval between AIS messages will affect power consumption of the AIS system, and so a balance is needed between frequent reports and power consumption.

4.6.2 Antennas

The AIS for AtoN unit will normally require two antennas, a position-fixing antenna and a VHF antenna for the AIS broadcasts. Antennae are available where these two antennae are combined in a single assembly. This latter configuration may be a better choice for floating AtoN, where installation of antennae is not usually a simple choice.

4.6.3 VHF range

AIS signals obey the laws of VHF propagation; the height of the VHF antenna on the AtoN and the height of the ship antenna, and the geography of the transmission path, will determine the range achieved.

4.6.4 Monitoring

The service provider should consider whether the AtoN AIS needs to be monitored, and facilities may be provided for remote monitoring if required.

4.6.5 Other considerations

The following items should be considered when a service provider is planning to install on-AtoN AIS units.

- Supply voltage range
- Environmental protection
 - Ambient temperature
 - Humidity
 - Vibration
 - EMC
 - etc
- Input and output connections

- Installation and commissioning procedures]

5 Message 21

Message 21 for AtoN is clarified in “IALA Technical Clarifications on Recommendation ITU-R M.1371-1”, edition 1.3. The reader should ensure that he uses the latest edition of this document.

“This message should be used by an A-to-N AIS station. This station may be mounted on an Aid-to-Navigation or this message may be transmitted by a fixed station when the functionality of an A-to-N station is integrated into the fixed station. This message should be transmitted autonomously at a Reporting Rate of once every three (3) minutes or it may be assigned by an Assigned Mode Command (Message 16) via the VHF data link, or by an external command. This message should not occupy more than two slots.”

6 Type of aid to navigation

The nature and type of AtoN can be indicated with 32 different codes, as shown below

	Code	Definition
	0	Default, Type of A to N not specified
	1	Reference point
	2	RACON
	3	Structure off shore, such as oil platforms, wind farms. (Note: This code should identify an obstruction that is fitted with an Aid-to-Navigation AIS station.)
	4	Spare
Fixed A to N	5	Light, without sectors
	6	Light, with sectors
	7	Leading Light Front
	8	Leading Light Rear
	9	Beacon, Cardinal N
	10	Beacon, Cardinal E
	11	Beacon, Cardinal S
	12	Beacon, Cardinal W
	13	Beacon, Port hand
	14	Beacon, Starboard hand
	15	Beacon, Preferred Channel port hand
	16	Beacon, Preferred Channel starboard hand
	17	Beacon, Isolated danger
	18	Beacon, Safe water
	19	Beacon, Special mark
Floating A to N	20	Cardinal Mark N
	21	Cardinal Mark E
	22	Cardinal Mark S
	23	Cardinal Mark W
	24	Port hand Mark
	25	Starboard hand Mark
	26	Preferred Channel Port hand
	27	Preferred Channel Starboard hand
	28	Isolated danger
	29	Safe Water
	30	Special Mark
	31	Light Vessel / LANBY/ Rigs

Notes

(1) The types of Aids to Navigation listed above are based on the IALA Maritime Buoyage System, where applicable.

(2) There is potential for confusion when deciding whether an aid is lighted or unlighted. Competent authorities may wish to use the regional/local section of the message to indicate this.